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Brief research report

Pure versus guided mirror exposure to reduce body dissatisfaction: A preliminary study with university women

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ABSTRACT

While effectiveness of mirror exposure to reduce body dissatisfaction has been demonstrated, the exposure was almost always combined with other interventions. The aim of the study was to evaluate the effectiveness of a pure mirror exposure intervention compared with a guided mirror exposure (participants are guided to describe their body shape in a non-evaluative manner) and an imagery exposure intervention (participants are guided to describe their body through mental representation). Thirty-one women with high body dissatisfaction received five sessions of treatment under one of the three conditions. All interventions reduced body dissatisfaction, but only the mirror exposures successfully reduced the frequency of negative thoughts and feelings of ugliness. Pure mirror exposure was more effective than guided exposure for reducing body discomfort within and between sessions. Pure mirror exposure, based on the traditional extinction paradigm, led to strong emotional activation followed by a fast decrease in emotional reactivity.

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Introduction

Body exposure (i.e., asking individuals to stand repeatedly and for prolonged periods in front of a mirror) is a central component of body image therapy and has been shown to reduced body image disturbance and avoidance behaviors in women with and without eating disordered symptoms (Delinsky & Wilson, 2006). Key, George, Beattie, Stammers, Lacey, and Waller (2002) compared two conditions of body image treatment within an inpatient program for anorexia nervosa. Only the treatment including mirror confrontation produced significant and sustained improvement in body dissatisfaction, reducing body anxiety and avoidance behaviors. Similarly, Delinsky and Wilson (2006) reported that a mindfulness-based adaptation of mirror exposure therapy resulted in significant improvements in body image disturbance compared with a non-directive body image treatment. Also, a new body exposure plus neutral description technique has been shown as

a promising strategy to reduce body dissatisfaction. Participants are asked to describe their physical appearance in a detailed, neutral way using a mirror or video technique. By describing one's body as precisely and as neutrally as possible, negative evaluations, such as "I am a fat nobody," were de-emphasized. This body exposure plus neutral description technique decreased body dissatisfaction in overweight adults and negative feelings concerning their body among individuals with binge eating disorder (Hilbert, Tuschen-Caffier, & Vögele, 2002) and increased body satisfaction and decreased anxiety in obese adolescents (Jansen, Bollen, Tuschen-Caffier, Roefs, Tanghe, & Braet, 2008). These data indicate that the body exposure without negative thinking led to the extinction of negative feelings.

To answer the question of whether cognitive restructuring is crucial for producing changes in body satisfaction, the aim of the present study was to compare the effectiveness of the body exposure plus neutral description technique with exposure without neutral description (pure mirror exposure). We dismantled the body exposure plus neutral description technique (Hilbert et al., 2002) by comparing three types of exposure interventions: pure mirror exposure, guided mirror exposure, and imagery (non-mirror) exposure. It was hypothesized that both mirror exposure interventions would be more successful for reducing body image disturbance than the non-mirror exposure intervention. It has been argued that exposure therapy involves a powerful negative

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emotional experience and leads to the extinction of the negative feelings by preventing escape from that affect (Key et al., 2002). Therefore, it was assumed that pure mirror exposure, based on the traditional extinction model of anxiety responses, would be as effective as guided mirror exposure for reducing body image disturbance.

Method

Participants

Thirty-one university women from southern Spain participated in this study. They were recruited through advertisements placed throughout the university campus asking for women with body dissatisfaction who were interested in receiving an experimental psychological treatment. In a screening session, they were informed about the study purpose, weighed, and measured. All three groups received the same initial description of the study purpose (any participant knew that the specific purpose of the study was to determine whether mirror exposure was superior to non-mirror exposure intervention). Participants were semi-randomly assigned to one of the three exposure interventions according to BMI. Then, they were briefly interviewed (for exclusion criteria) and asked to complete the Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987) and the Eating Attitude Test (EAT; Garner, Olmsted, Bohr, & Garfinkel, 1982). Participants were excluded if they had (a) BSQ scores < 105 and EAT scores > 30 (to select women without substantial eating disordered symptoms), (b) a body mass index (BMI) < 20 or > 28 (to make sure that their body dissatisfaction was not due to extremes in body size) and (c) were currently following a weight loss program (to ensure that changes in body dissatisfaction were not due to changes in body weight). All participants received a detailed description of the intervention for each exposure condition ($n = 10$, pure mirror exposure condition; $n = 10$, guided mirror exposure condition; and $n = 11$, imagery exposure condition). The groups did not differ in age ($M = 20.12$, $SD = 1.76$) or BMI ($M = 24$, $SD = 2.83$).

Psychological Measures

The Eating Attitude Test (Garner et al., 1982) is a 40-item instrument used to assess a broad range of eating disorder symptoms. Cut-offs of 30 and 50 characterize at-risk and clinical populations, respectively (Mintz & O'Halloran, 2000). In the present study, the Spanish version of EAT was used (Castro, Toro, Salamero, & Guimera, 1991). The alpha was .98 in this study.

The Body Shape Questionnaire (Cooper et al., 1987) is a 34-item questionnaire assessing body image concerns. The clinical cut-off is 105. Also the Spanish version of BSQ was used (Raich, Mora, Soler, Avila, Clos, & Zapater, 1996). The alpha across all administrations ranged from .80 to .94 in this study.

The Thoughts Checklist (TCL; Cooper & Fairburn, 1992) was made up of self-statements chosen to be typical of the thoughts individuals with eating disorders might have while completing the mirror confrontation task. The TCL includes 16 negative items rated by the frequency of occurrence (1 = *thought did not occur* to 6 = *thought was there all the time*). For each of the three conditions, a mean of the negative cognitions score was computed. The alpha across all administrations ranged from .78 to .80 in this study.

A visual analogue scale (VAS) was used to measure the dimension of beauty versus ugliness. The word beauty was located at the left side of the scale, and the word ugly was at the right. The participants marked the line between the words according to their feelings of beauty and ugliness. A score of zero was given for the beauty extreme and a score of 100 for the ugly extreme.

A subjective discomfort scale (SDS) was used to assess the level of discomfort felt by participants during the sessions. Participants rated their feeling at the beginning of the session and every 5 min during the session using a scale from 1 (no discomfort at all) to 10 (maximum discomfort).

Procedure

Before the treatment sessions started, participants individually completed all of the self-report measures. Under the two mirror exposure conditions, they were given beige colored underwear to wear for each treatment session. All participants received five exposure sessions for 40 min twice a week. Afterwards, participants again completed all measures, except the EAT, and were weighed. One month later, follow-up data from the questionnaires were collected.

Participants under the two mirror exposure conditions were instructed to stand at a distance of two feet in front of the mirror. In the pure mirror exposure intervention, they were asked to look freely at their entire body and pay attention to their feelings and thoughts. They were asked to be completely focused on their body and to try not to relieve the discomfort caused by this exercise. Participants spoke aloud during the session so the researchers could monitor whether participants were focused on trouble body areas. Participants in the guided mirror exposure intervention also stood in front of the mirror and were asked to describe themselves as precisely as they could by answering questions that were asked to them by the therapist from the exposure manual (Tuschen-Caffier & Florin, 2002; Tuschen-Caffier, Pook, & Frank, 2001). The procedure comprised questions designed to enhance the attention focused on specific body areas, such as the head, upper and lower body, legs, arms and feet (e.g., "What do your eyes look like?"). Participants in the guided imagery exposure intervention had to describe their body through the mental representation of their body with the same protocol as the guided mirror exposure intervention; however, they were not in front of a mirror and did not wear the underwear. Body discomfort throughout the sessions was measured using the SDS.

Statistical Analyses

Statistical analyses of BSQ, TCL, and VAS were based on 3×3 repeated measures ANOVAs with Intervention as a between-subjects factor (pure vs. guided vs. imagery) and Time as a within-subjects factor (pre-intervention, post-intervention, 1-month follow-up). SCS during the sessions was analyzed by a $3 \times (5 \times 10)$ repeated measures ANOVA with Intervention as the between-subjects factor and Sessions (5) and Measures (10: 1 baseline and 9 measures throughout each session) as the within-subjects factors. The Greenhouse–Geisser epsilon correction was applied. Results are reported with size effect (η^2) and statistical power ($1 - \beta$). Post hoc tests were performed using the *t* statistic. The level of significance was set at .05 for all analyses.

Results

Table 1 shows the means (and standard deviations) for body dissatisfaction, negative thoughts, and beauty–ugliness as a function of intervention phase and group. No significant differences were found on these measures at the pre-intervention phase.

Body Dissatisfaction

ANOVA results revealed a significant main effect of Time, $F(2, 56) = 37.56$, $p < .001$, $\eta^2 = .57$, $1 - \beta = 1.00$, and a significant Intervention \times Time interaction, $F(4, 56) = 2.68$, $p < .05$, $\eta^2 = .16$,

Table 1
Means and standard deviations of measures in each intervention group.

		Pure Exposure (<i>n</i> = 10)	Guided Exposure (<i>n</i> = 10)	Imagery Exposure (<i>n</i> = 11)
Body Shape Questionnaire	Pre	136 (14.28)	131.1 (14.47)	123 (16.27)
	Post	94.7 (29.97)	107.40 (27.86)	108.36 (22.48)
	Follow-up	89.80 (27.82)	102.36 (18.20)	103.45 (23.19)
Thoughts Checklist	Pre	2.83 (0.62)	2.49 (0.28)	2.48 (0.71)
	Post	1.73 (0.49)	1.91 (0.71)	2.20 (0.59)
	Follow-up	1.93 (0.58)	2 (0.62)	3.38 (0.69)
VAS beauty-ugliness	Pre	56 (15.27)	53.4 (20.34)	57.45 (23.96)
	Post	35.9 (25.47)	43 (21.59)	55.09 (27.53)
	Follow-up	33.7 (27.9)	41.6 (15.5)	51.90 (30.14)

Note. VAS = Visual Analogue Scale. * $p < .05$; ** $p < .01$; *** $p < .001$.

$1 - \beta = .71$. The three groups showed significant reductions from pre-intervention to post-intervention and follow-up, but the differences were larger for pure mirror exposure than for guided mirror exposure and imagery exposure groups (see Table 1). Post hoc comparisons of the changes from pre-intervention revealed significant group differences between pure mirror and imagery exposure groups at both post-intervention ($p < .03$) and follow-up ($p < .02$). The differences between pure mirror and imagery exposure groups were marginally significant at follow-up ($p = .09$). No other group comparison was significant.

Negative Thoughts

ANOVA results showed a main effect of Time, $F(2, 56) = 24.26$, $p < .001$, $\eta^2 = .46$, $1 - \beta = .99$, and a significant Intervention \times Time interaction, $F(4, 56) = 3.92$, $p < .02$, $\eta^2 = .22$, $1 - \beta = .78$. As can be seen in Table 1, only the pure and guided mirror exposure groups showed significant reductions at both post-intervention and follow-up. The imagery exposure group showed a significant reduction just at post-intervention. Post hoc comparisons of the changes from pre-intervention revealed significant group differences only between pure mirror and imagery exposure groups at both post-intervention ($p < .01$) and follow-up ($p < .01$). The difference between pure and guided mirror exposure groups was marginally significant at post-intervention ($p = .06$). No other group comparison was significant.

VAS Beauty–Ugliness

ANOVA results revealed a main effect of Time, $F(2, 56) = 7.1$, $p < .05$, $\eta^2 = .20$, $1 - \beta = .87$. The three groups showed a reduction from pre-intervention to post-intervention and follow-up, but only the pure mirror exposure group reached significance from pre-intervention to follow-up (see Table 1). No other group comparison was significant.

Subjective Discomfort Within and Between Sessions

Fig. 1a and b shows the average discomfort data throughout and within sessions as a function of the groups. The Intervention \times Sessions \times Measures ANOVA revealed main effects for

Sessions, $F(4, 108) = 59.68$, $p < .001$, $\eta^2 = .69$, $1 - \beta = 1.00$, and Measures, $F(9, 243) = 5.31$, $p < .05$, $\eta^2 = .16$, $1 - \beta = .93$. There were also significant interaction effects for Intervention \times Sessions, $F(8, 108) = 8.78$, $p < .001$, $\eta^2 = .39$, $1 - \beta = 1.00$, and Intervention \times Measures, $F(18, 243) = 3.21$, $p = .05$, $\eta^2 = .19$, $1 - \beta = .92$.

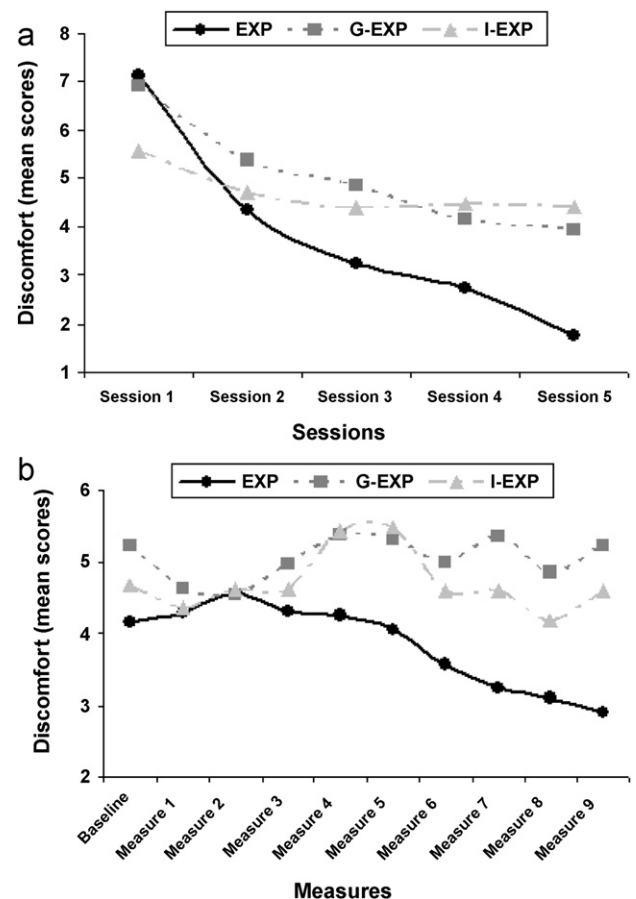


Fig. 1. Means of subjective discomfort (a) between and (b) within sessions as a function of the groups. EXP: pure mirror exposure; G-EXP: guided mirror exposure; I-EXP: imagery (non-mirror) exposure.

Analysis of the Intervention \times Sessions interaction revealed significant differences between the three groups in the linear trend ($p < .0001$). As can be seen in Fig. 1a, the pure mirror exposure group had the largest reduction in subjective discomfort throughout the sessions. Differences between pure and guided mirror exposure groups appeared in Sessions 3 ($p < .04$) and 5 ($p < .005$). Differences between pure mirror and imagery exposure groups appeared in Sessions 4 ($p < .04$) and 5 ($p < .001$). No significant differences appeared between guided mirror and imagery exposure groups.

Analysis of the Intervention \times Measures interaction revealed significant differences between the three groups in the linear ($p < .03$) and cubic ($p < .03$) trends. As can be seen in Fig. 1b, the pure mirror exposure group showed an increase in the first three measures followed by a steady decrease in the last four measures (all $ps < .03$). The guided mirror and imagery exposure groups showed significant increase towards the middle of the session (all $ps < .05$) followed by a return to the initial level (imagery exposure group) or no return (guided mirror exposure group) by the end of the session.

Discussion

Our findings indicate that the three interventions significantly reduced body dissatisfaction, but only interventions including mirror confrontation resulted in sustained reduction in the frequency of negative thoughts and/or feelings of ugliness. On the other hand, measures of subjective discomfort within and between the sessions indicate the superiority of the pure mirror exposure intervention in reducing such discomfort compared to the other two interventions. These findings support the hypothesis that pure exposure intervention is successful for reducing body image disturbance.

A fascinating question is why pure mirror exposure was more effective than guided mirror exposure in reducing body image discomfort within sessions. For the guided exposure intervention, the body is the conditioned stimuli, and negative thinking is the unconditioned stimuli leading to negative feelings, such as anxiety and avoidance behavior (Jansen et al., 2008). According to this model, participants exposed to their body with neutral thinking reduce their negative feelings through cognitive restructuring. However, the pure exposure intervention also led to the reduction of negative feelings, and the data suggest that the reduction was faster. Based on the traditional extinction model, it could be argued that pure exposure produces a faster reduction because it does not interfere with the natural flow of expression of the negative feelings. Therefore, pure exposure could be successful in reducing body image disturbance because of the emotional rather than the cognitive response (Key et al., 2002).

Various alternative explanations are possible. Our procedure of having participants responding to the question about the level of body discomfort every 5 min during the therapeutic session can be considered a form of self-reflection and, therefore, can be interpreted as a cognitive intervention. On the other hand, the faster

decrease in body discomfort during the sessions in the pure exposure intervention could be interpreted as a form of avoidance (e.g., participants could be avoiding troubled body parts given the non-directional nature of this kind of exposure). However, this explanation seems unlikely as the post-intervention and follow-up measures showed a significant improvement in body dissatisfaction, negative thoughts, and feelings of ugliness.

This was a preliminary study with a very small sample. Therefore, findings should be interpreted with caution until replicated with a larger sample. Additionally, all participants knew that they were being evaluated for a body image treatment and knew the purpose of this study, which could have influenced their responses. In spite of these limitations, the data are promising and support that pure exposure (as is guided exposure) is effective for reducing body image disturbances in a subclinical population. Further investigation is needed to confirm whether pure exposure is also successful at reducing body image disturbances in women with eating disorders and who have BMI under 20 or over 28.

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